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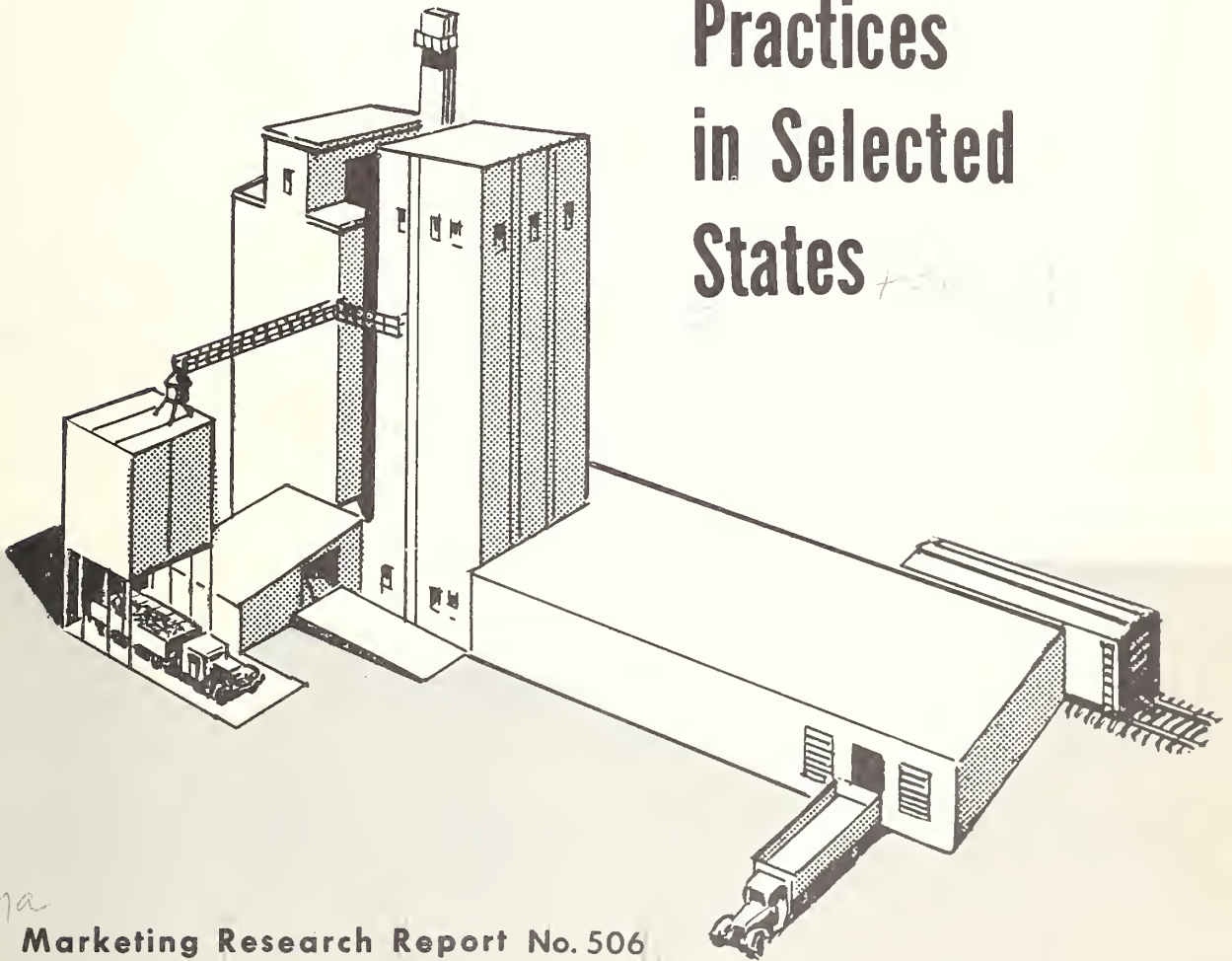
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The Changing FEED MIXING INDUSTRY

Practices in Selected States



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Marketing Economics Division
Economic Research Service

UNITED STATES DEPARTMENT OF AGRICULTURE

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SUMMARY

A mail survey was made of feed-mixing establishments in 8 States--Massachusetts, Pennsylvania, Georgia, Indiana, Iowa, Colorado, California, and Washington. About 85 percent of the establishments surveyed were retailing feed. Between 33 and 41 percent of the feed retailers in the 8 States sold less than 500 tons a year, and 64 percent of the retailing establishments mixed feed on the same premises where feed was retailed. There was a tendency for establishments retailing over 3,500 tons a year to install mixing equipment.

Practically all the establishments offered some type of credit. Competition has increased the use of feed contracts and the amount of financing offered farmers. Feed retailers in every State studied used some form of feeder contract, but the volume handled under contract varied from a small percentage of total sales up to 100 percent. Various short-term and production-term financing programs were nearly always available. The provisions varied with every State and type of livestock raised.

Seventy percent of the establishments surveyed were feed mixers. The percentage varied widely between States: From a low of 21 percent in Massachusetts to a high of 89 percent in Indiana. Feed mixers in the survey indicated that mixing supplements were generally used to prepare complete feeds in plants producing under 10,000 tons annually. Mixers with large volumes -- 10,000 to 50,000 tons per year -- tended to use the premixes for manufacturing complete feeds.

Custom mixing of feeds generally was done in the smaller plants. Usually the larger the mixing volume, the smaller the proportion of custom-mixed feeds. The use of grain banks in grain-surplus areas has helped increase the volume of custom-mixed feeds in recent years.

Bulk sales of feed have increased in many parts of the country, especially in the West; the practice seems to be moving from West to East. But sales of bagged feed still represent a large portion of the industry's tonnage in the East.

Various other recent trends such as on-the-farm mixing have had a tremendous influence in the feed mixing industry. On-the-farm mixing has gained, especially in areas with large-scale feeding operations.

About 50 percent of all establishments surveyed in 1959 indicated that their geographic sales areas were the same as 5 years earlier. The majority of the feed mixers surveyed believed the size of their sales areas had increased during this time while other retailers indicated that their sales area had decreased in size.

~~X~~THE CHANGING FEED MIXING INDUSTRY,

Practices in Selected States

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The feed-mixing industry has changed rapidly in recent years. Among the principal trends noted in this industry are the increase in size of farms, integration of the feed industry and livestock production, bulk delivery of feed, direct sales to farmers, and the growth of on-farm and custom mixing.

This report describes the current structure and practices of the industry. Since the industry differs from one part of the country to another, one object of the research was to learn more about the direction the trends are taking in various areas and the speed with which the trends spread from one area to another. Estimates provided by the industry concerning trends in the various trade areas are summarized.

METHODOLOGY

A mail survey of feed retailing and mixing establishments was conducted in 8 States: Massachusetts, Pennsylvania, Georgia, Indiana, Iowa, Colorado, California, and Washington. These 8 States were selected, with the help of various segments of the industry, to represent different types of livestock and poultry production and different types of feed mixing companies.

In view of the difficulty in defining the industry and the great expense involved in a relatively complete check of nonrespondents in each of the 8 States, no personal interview of nonresponse was included in the study. ²/ Instead, this report should be interpreted as summarizing the operations and estimates of the respondents who produced 16,777,000 tons of feed in 1959 or about 40 percent of the total reported volume of formula feed consumed in the United States. In view of (1) the large volumes mixed and retailed by the respondents, (2) the fact that these respondents still show the preponderance of small retailers and mixers in the industry, and (3) the fact that the report summarizes the responses by types of operation performed and by volume groupings within these types, it is believed that the findings represent the industry located in each of the 8 States.

¹/ Dr. Brensike died July 1961.

²/ See the appendix for more information on the survey design.

RETAILING

About 85 percent of the industry establishments responding to the questionnaire indicated that they retailed feed frequently along with many other farm service items. This percentage varied from a low of 79 percent of the respondents in Georgia to a high of 98 percent in Massachusetts.

Nearly two-thirds of these establishments mixed feed as well as retailed it at the same location (table 1). The other 36 percent of the establishments retailed feed mixed at other plants. The industry in Massachusetts seemed to differ considerably from that in the other States; only 20 percent of the establishments retailing feed in Massachusetts indicated that they also mixed feed at that location. In contrast, about 80 percent of the establishments retailing feed in Indiana, Georgia, and Pennsylvania also mixed feed at the same location. In Iowa, California, Colorado, and Washington, about half of the establishments mixed feed.

Many of the retailers, regardless of geographic location and their related functions, tended to handle small volumes. Between 33 and 41 percent of these establishments sold less than 500 tons per year. Many grain elevators, machinery dealers, and other agricultural businesses sell mixed feeds as one part of their service program for their customers. This apparent industry-wide emphasis on

Table 1.--Establishments retailing mixed feeds, by annual tonnage retailed, sample in 8 States, 1959

Annual sales and type of operation	Mass.	Pa.	Ga.	Ind.	Iowa	Colo.	Calif.	Wash.
	Number	Number	Number	Number	Number	Number	Number	Number
Less than 500 tons:								
Retail only.....	21	23	8	17	67	36	40	36
Retail & mix.....	6	74	33	61	30	26	12	11
500-3,499 tons:								
Retail only.....	35	24	10	8	50	21	19	20
Retail & mix.....	6	113	33	78	116	22	14	26
3,500-6,499 tons:								
Retail only.....	6	3	2	1	2	0	2	3
Retail & mix.....	2	13	10	13	17	7	17	11
6,500-9,499 tons:								
Retail only.....	2	0	0	0	0	1	1	1
Retail & mix.....	1	7	4	4	3	2	10	4
9,500 tons and over:								
Retail only.....	0	2	2	0	1	0	4	1
Retail & mix.....	0	3	5	9	6	7	31	5
Total								
Retail only.....	64	52	22	26	120	58	66	61
Retail & mix.....	15	210	85	165	172	64	84	57

small-volume retailers tended to be more prevalent among the "retail only" classification than among those who both retailed and mixed feeds.

It appeared that once an establishment has obtained a retail volume of 3,500 tons per year, there is a strong tendency to install mixing facilities. One explanation for this could be that a retail feed business with this volume has to expand its services to attract new customers. In grain-producing areas, a large share of the retail mixer's business is custom grinding and mixing. Another explanation for this change in industry structure is that management may believe sales are large enough to make it economical to mix its own brand of feed. Previous studies of economies of scale indicate that an annual volume of at least 10,000 tons is required to mix formula feed economically. It is important to remember, however, that most of these small-volume mixers do custom mixing for farmers and that the service charges levied cover the costs at a volume of about 2,000 tons per year. Thus, custom milling provides a means for increasing the volume of feed supplements and concentrates sold.

Georgia, Indiana, and California appeared to have relatively more large-volume mixers and retailers than other States. Integration and intransit shipments undoubtedly play a part in determining the relative average volume per establishment in the 8 States included in the survey. 3/

Types of Feed Sold

Broiler feed tended to represent a much larger proportion of the mixed feeds sold by the large retailers than by small retailers in Georgia, Pennsylvania, Indiana, California, and Washington (table 2). Likewise, large retailers in all States except Iowa, Washington, and Colorado tended to sell a larger percentage of feed as some type of poultry feed than the small retailers. Small retailers tended to distribute their sales more evenly among the types of feeds, although the major animal production of the States shows up in their sales. Integration and large-scale farm production units affect a feed establishment's sales program. Large-volume firms are usually better able to provide large farms with the extra services and credit they require.

In nearly all States, more of the retailers selling 500 to 3,500 tons per year handled two or more brands of their major type of feed than retailers in other volume groups (table 3). About half of the small retailers -- those handling less than 500 tons per year -- also tended to handle two or more brands of feed. In these two small-volume groups, about the same percentage of retailers handled two or more brands of feed regardless of whether or not they mixed at the same location. In the larger volume groups, the "retail only" classification tended to drop out and only about 30 percent of the retail-mixers handled a brand in addition to their own. Many small establishments retail two or more brands because it is a way of increasing sales tonnage without increasing the sales area.

3/ Integration is the combining of many or all operations from the producer through the market with effective controls by centralized management. This may be done by any firm involved either by outright ownership or contractual arrangements.

Milling-in-transit is an operation permitted under the stopping-in-transit privilege. In this case the formula feed manufacturer receives ingredients by rail, blends them into a prepared feed, ships the finished product by rail to the consumer on a through rate basis. The rates used are determined by several factors; for example, the distance grain and grain byproducts are shipped into the mill will influence the rate to destination.

Table 2.--Types of feed sold as a percentage of total sales, by annual tonnage retailed, 8 States, 1959

Annual sales and type of feed	Mass.	Pa.	Ga.	Ind.	Iowa	Colo.	Calif.	Wash.
	Percent	Percent	Percent	Percent	Percent	Percent	Percent	Percent
Under 3,500 tons:								
Broiler	7	5	13	4	1/	2	6	5
Other poultry	42	43	33	28	22	23	34	36
Hog	2	8	24	43	49	7	3	5
Dairy	40	38	17	13	8	15	18	40
Beef cattle	3	3	9	11	19	39	28	10
Other	6	3	4	1	2	14	11	4
Total	100	100	100	100	100	100	100	100
3,500 tons and over:								
Broiler	5	21	74	13	1	1	13	17
Other poultry	63	48	10	30	25	22	63	23
Hog	1	5	3	33	44	13	3	1
Dairy	29	20	10	16	6	34	15	55
Beef cattle	1	4	2	4	23	26	5	2
Other	1	2	1	4	1	4	1	2
Total	100	100	100	100	100	100	100	100

1/ Less than 0.5 percent.

Retail Practices

The number of establishments having full-time salesmen increased as the annual retail volume increased (table 4). This is to be expected since small retailers' volumes do not warrant a full-time salesman. In most companies salesmen not only make the sales contacts but also handle service work, credit, collections, and customer relations. Nearly all States showed the same general pattern in this respect. Retail-mixers tend to use more salesmen than the purely retail establishments, irrespective of the annual volume retailed, since the retailers obtain sales and service assistance from the larger feed manufacturer whose feed they sell.

Geographic location of the industry appeared to influence the proportion of total feed delivered to farms (table 5). Farm delivery, however, may be even more closely related to the type of service competition in the State. Retail establishments in Iowa delivered between 56 and 100 percent of their sales. In Colorado, retailers delivered between 35 and 73 percent of their total sales volume.

Similarly, the percentage of total retail sales volume delivered tended to increase with total volume until 6,500 tons per year was achieved (table 5). Whether the establishment was a retailer only or a retailer-mixer did not seem to affect the proportion of the total feed sales delivered.

Table 3.--Percentage of establishments selling two or more brands of their major type of feed, by annual tonnage retailed, 8 States, 1959 ^{1/}

Annual sales and type of operation	Mass.	Pa.	Ga.	Ind.	Iowa	Colo.	Calif.	Wash.
	Percent	Percent	Percent	Percent	Percent	Percent	Percent	Percent
Less than 500 tons:								
Retail only.....	48	65	50	41	58	64	70	78
Retail & mix.....	48	39	41	39	54	60	60	77
500-3,499 tons:								
Retail only.....	57	54	70	25	62	<u>2/</u> 67	74	85
Retail & mix.....	56	62	35	49	<u>3/</u> 62	56	52	65
3,500-6,499 tons:								
Retail only.....	67	100	--	--	--	--	50	67
Retail & mix.....	50	69	33	46	16	43	16	50
6,500-9,499 tons:								
Retail only.....	50	--	--	--	--	--	100	100
Retail & mix.....	33	29	0	25	0	33	22	40
9,500 tons and over:								
Retail only.....	--	--	50	--	<u>4/</u>	--	25	<u>4/</u>
Retail & mix.....	--	20	14	29	<u>14/</u>	14	8	<u>33</u>

^{1/} Poultry feed was the largest selling item except as noted.

^{2/} Beef cattle feed.

^{3/} Hog feed.

^{4/} Single plant responses not shown in the larger volumes to avoid disclosure of plant identity.

Larger feed retailers tend to deliver a larger proportion of their feed sales. Many smaller retailers frequently use a "cash and carry" system so that deliveries are reduced to a minimum. The feeder is given a discount if he picks up feed at the retail warehouse and pays cash for it. In many areas, large firms have gone into bulk business; it is quite likely, therefore, that the dealer's bulk truck will do the delivering.

Nearly all feed retailers, unless they are small outlets for general farm supplies, must retain a few large feeder customers. The importance of the 5 largest feeders to the small retailers is shown in table 6. If the small retailers lose these customers, as farms increase in size or become integrated, or through failure to keep up with the farmer feeders' knowledge of nutrition, then the nature of the feed industry could change drastically.

Sales to large feeders represent a smaller portion of total sales as the volume retailed increases. Establishments retailing less than 500 tons annually in Massachusetts, Pennsylvania, Georgia, and Iowa tended to sell the largest percentage to their 5 largest feeders. In California and Colorado the firms retailing between 500 and 3,499 tons sold the greatest percentage to the 5 largest feeders.

Table 4.--Percentage of feed establishments having full-time salesman,
by annual tonnage retailed, 8 States, 1959

Annual sales and type of operation	Mass.	Pa.	Ga.	Ind.	Iowa	Colo.	Calif.	Wash.
	Percent	Percent	Percent	Percent	Percent	Percent	Percent	Percent
Less than 500 tons:								
Retail only.....	5	4	0	29	6	6	2	11
Retail & mix.....	33	9	6	5	3	12	25	0
500- 3,499 tons:								
Retail only.....	37	17	20	25	18	19	32	20
Retail & mix.....	17	33	9	21	24	27	36	27
3,500-6,499 tons:								
Retail only.....	33	67	50	0	50	--	100	33
Retail & mix.....	50	38	50	54	41	86	65	45
6,500-9,499 tons:								
Retail only.....	50	--	--	--	--	--	100	0
Retail & mix.....	100	71	50	25	67	100	90	25
9,500 tons and over:								
Retail only.....	--	50	50	--	1/	--	50	1/
Retail & mix.....	--	100	80	56	50	71	84	80

1/ Single plant responses not shown in the larger volumes to avoid disclosure of plant identity.

Integration and Credit

Feed retailers in every State used feeder contracts. The use of contracts varied however, from only a small percentage to 100 percent of an establishment's sales.

In areas of specialized poultry and livestock production, integration with farm production may be the only way to expand or retain the current volume of retail feed sales. Competition in this fast-moving industry has been such that many firms in some areas of the country have had to reorganize their entire system of sales and distribution. Georgia, Indiana, and Iowa had the largest percentage of retailers involved in integration and contractual arrangements. Many of the large-volume retailers in the other States also indicated that they used feeder contracts. The percentage of retailers and retail-mixers who were involved in integration and contracts seemed to increase as the annual sales volume increased.

In many feeder contracts the retailer supplied nearly all production items except labor; in others, he provided little more than the feed, medicants, and some supervision. The retailer received his payment, as provided in the contract, out of the proceeds from the flock or other products which often were sold by his own organization.

Nearly all feed retailers prefer to stay in the retailing function and indicated that they do not wish to provide production credit. However, many indicated that they guaranteed production credit obtained through banks and the Production Credit Association. In this event, the bank made the loan and the feed company usually guaranteed the payment to the bank. Such a guarantee requires certain controls to insure against losses. These controls certainly involve some production and marketing supervision although the dealer's control may vary with individual feeders.

Nearly all retail dealers, even though they indicated that they did not provide production credit, did provide what they classed as "short-term" credit. The type of short-term credit ranged from discounts and interest charges designed to reduce the principal to something very much like production credit.

Short-term credit was offered by nearly all retail outlets. It usually meant free credit for 30 days but some establishments allowed up to 120 days of free credit. The availability of free credit for different periods, even in the same firm, frequently appeared to be tied into the length of the production period for the livestock or poultry.

If feed bills were not paid during this free-credit period the retailers began to charge interest. In some cases, retailers placed an immediate interest charge of 4 to 6 percent on the bill at the end of the free period and then added 1/2 percent per month thereafter. In other cases, retailers charged from 1/2 to 3 percent or more interest for each month after the free period.

Table 5.--Percentage of feed sales delivered to farms, by annual tonnage retailed, 8 States, 1959

Annual sales and type of operation	Mass.	Pa.	Ga.	Ind.	Iowa	Colo.	Calif.	Wash.
	Percent	Percent	Percent	Percent	Percent	Percent	Percent	Percent
Less than 500 tons:								
Retail only.....	63	45	36	57	62	35	15	29
Retail & mix.....	98	72	48	52	71	54	44	79
500-3,499 tons:								
Retail only.....	83	62	70	45	76	69	57	59
Retail & mix.....	92	59	75	44	56	73	64	73
3,500-6,499 tons:								
Retail only.....	74	68	90	65	60	--	90	--
Retail & mix.....	90	78	70	72	79	65	73	72
6,500-9,499 tons:								
Retail only.....	45	--	--	--	--	55	--	100
Retail & mix.....	40	97	79	31	99	45	96	89
9,500-tons and over:								
Retail only.....	--	24	100	--	1/94	--	67	1/23
Retail & mix.....	--	81	90	66	94	65	73	23

1/ Single plant responses not shown in larger volumes to avoid disclosure of plant identity.

Table 6.--Percentage of feed sold to the 5 largest feeders, by annual tonnage retailed, 8 States, 1959

Annual sales and type of operation	Mass.	Pa.	Ga.	Ind.	Iowa	Colo.	Calif.	Wash.
	Percent	Percent	Percent	Percent	Percent	Percent	Percent	Percent
Less than 500 tons:								
Retail only.....	52	38	6	35	32	33	16	26
Retail & mix.....	48	32	30	30	22	31	27	35
500-3,499 tons:								
Retail only.....	44	34	21	11	25	44	50	38
Retail & mix.....	45	9	20	18	12	40	28	38
3,500-6,499 tons:								
Retail only.....	28	18	28	6	22	--	40	31
Retail & mix.....	34	29	24	30	14	10	28	18
6,500-9,499 tons:								
Retail only.....	25	--	--	--	--	32	--	22
Retail & mix.....	20	20	20	26	20	15	22	41
9,500 tons and over:								
Retail only.....	--	--	--	--	$\frac{1}{12}$	--	--	$\frac{1}{23}$
Retail & mix.....	--	10	29	41	12	18	23	23

$\frac{1}{12}$ Single plant responses not shown in the larger volumes to avoid disclosure of plant identity.

In addition to charging monthly interest after the free credit period passed, many feed retailers gave discounts to encourage rapid payments for their feed sales. These cash discounts seemed to range from 1 to 3 percent of the bill, although some also were based on a discount of 1 to 4 dollars per ton. The discount period for cash ranged from about 10 days to the end of the free credit period.

MIXING

Nearly 70 percent of the feed establishments responding to the questionnaire indicated that they mixed feed. This percentage varied from a low of 21 percent in Massachusetts to a high of 89 percent in Indiana. Pennsylvania had the largest percentage (97 percent) of the total mixing plants in the small-volume category of less than 10,000 tons annually (table 7). At the other extreme was California, where only 55 percent of the plants had an annual volume of less than 10,000 tons. The remaining States had between 75 and 86 percent of their feed mixing plants in the small-volume categories.

In Georgia, one-fourth of the establishments did only feed mixing and three-fourths performed both the mixing and retailing function at the same location (table 7). At the other extreme, less than 15 percent of the establishments in Colorado, Massachusetts, and Pennsylvania did only feed mixing.

Table 7.--Establishments mixing feed, by annual volume mixed, sample in 8 States, 1959

Annual volume mixed and type of operation	Mass.	Pa.	Ga.	Ind.	Iowa	Colo.	Calif.	Wash.
	Number	Number	Number	Number	Number	Number	Number	Number
Less than 10,000 tons:								
Retail & mix.....	12	204	70	133	159	52	46	49
Mix only.....	1	31	15	27	25	7	11	8
10,000-24,999 tons:								
Retail & mix.....	1	3	9	21	10	7	24	6
Mix only.....	0	0	8	4	7	0	5	0
25,000-49,999 tons:								
Retail & mix.....	1	3	3	5	2	4	5	2
Mix only.....	0	0	3	2	4	0	2	0
50,000 tons and over:								
Retail & mix.....	1	0	3	6	1	1	9	0
Mix only.....	1	1	3	4	5	0	2	2
Total								
Retail & mix.....	15	210	85	165	172	64	84	57
Mix only.....	2	32	29	37	41	7	20	10

Manufacturing Practices

The large mixing plants in Washington, Massachusetts, and Colorado tended to mix their feeds from the "ground up" rather than use either supplements or premixes mixed at other locations. As a general rule, mixing supplements prepared at other locations were used by more of the small plants (less than 10,000 tons mixed annually), and premixes mixed at other locations were used mainly by plants having an annual volume of 10,000 to 50,000 per year. In fact, mixing supplements, mixed at another location, were seldom reported as being used by the larger volume plants. Those who did report using them undoubtedly did so primarily for some of their smaller volume brands or mixes. Many of the medium and small volume mixers used both the premixes and the mixing supplements, according to which was most economical.

In general, mixing supplements tended to contain mostly feed ingredients other than grain. Often these mixing supplements represent about 40 percent of the volume of a complete mixed feed. Premixes generally contain only the minor elements, such as vitamins, antibiotics, and minerals, on a carrier or diluent and represent only 25 to 50 pounds per ton of completely mixed feeds.

The type of feed manufactured has an important bearing on whether a premix or supplement is used in mixing. Poultry feed, for example, contains many micro-ingredients including drugs, and smaller mixer firms cannot economically justify the cost of equipment, facilities, and labor needed to blend the microingredients into a premix or a supplement. Also, many firms do not believe that a premix is

cheaper to use than a supplement. Likewise, the mixing ability of the equipment frequently determines whether a premix or a supplement is used.

In California, very little of the feed, even in the small plants, was custom mixed for farmers (table 8). But in Pennsylvania, Massachusetts, Indiana, and Iowa, nearly two-thirds of the feed in plants mixing less than 10,000 tons a year was custom mixed for farmers. Usually, the larger the mixing plant, the smaller the percentage of custom-mixed feed. Under unusual circumstances, however, such as a large grain bank operation in a surplus-grain area or mixing feeds for another company, large firms may increase their custom mixing.

Custom mixing may be defined as the mixing of ingredients according to a formula prescribed by the buyer rather than the mixer. Custom mixing is usually done in small establishments for farmer feeders and often involves the receipt, grinding, and mixing of a farmers' own grain. This operation is performed by both stationary and mobile feed mills and is an important phase of the mixed feed industry in areas producing a surplus of feed grain.

In the grain-surplus States, a rather high percentage of the grain is fed to farmers' own stock. Many farmers, especially larger feeders, try to reduce the per unit feed costs in every way possible. Farmers believe it is more logical to use their own grains together with a mixing supplement to obtain a balanced ration rather than to purchase complete feeds.

Feeders have realized economical gains from less expensive custom-mixed rations. Feed manufacturers have set up feeding programs for feeders using supplements. Balanced rations may be had by using the feed manufacturers' recommendations of the proper proportions of grain and feeding supplements. Feed retailer-mixers in recent years have installed custom milling equipment so that they may serve their customers better and meet competition.

Recently many feed mills have offered to store part of a farmer's feed grain for him in anticipation of its later use in custom milling. This, of course, adds

Table 8.--Percentage of custom-mixed feed as percentage of annual tonnage mixed, 8 States, 1959

Annual tonnage mixed	Mass.	Pa.	Ga.	Ind.	Iowa	Colo.	Calif.	Wash.
	Percent	Percent	Percent	Percent	Percent	Percent	Percent	Percent
Less than 10,000.....	65	66	48	62	58	52	22	35
10,000-24,999.....	0	7	10	22	27	9	2	28
25,000-49,999.....	1	0	15	96	46	60	9	10
50,000 and over.....	2	<u>1</u> / ₂	29	45	50	<u>1</u> / ₂	15	3

1/₂ Single plant responses not shown in the larger volumes to avoid disclosure of plant identity.

further convenience to the farmer's delivery of the grain for grinding and mixing, and to his pickup or the delivery of the mixed feeds.

This use of grain banks to store farmers' grain in preparation for later use in custom feed mixing is naturally heaviest in areas of surplus feed grain (table 9). But even in these areas local competitive conditions have encouraged more use of the grain bank in Indiana than in Iowa, Pennsylvania, and Colorado. No grain bank operations were found in Massachusetts and they were of only minor importance in Georgia, California, and Washington. In these States, the grain bank appeared to be used primarily by mixers in the two small-volume groups.

Grain banks have increased primarily in the areas where grains are plentiful and low priced. Feeders look for ways of reducing costs especially when livestock prices are low. Since feed is the largest item of cost, it is the first one to be considered by feeders. A feeder capable of producing a large quantity of grain economically believes that it is to his advantage to feed it to livestock and thus convert it into a more valuable product such as meat and eggs. If the feed mixer can keep the feeder as a customer with the "grain bank" then some profits are still realized from service charges for storing and grinding and mixing it with supplements.

This system has proved successful in some areas even though some problems arise in the mechanics of the plan. Both the feeder and the feed mixer seem to benefit by such an arrangement. 4/

Grain banks operate by holding feed grains in storage in anticipation of their being withdrawn for use in custom mixing. Charges are normally made for services such as receiving, grinding, storing, and later mixing. Farmers like the service because of the added convenience of large rather than piecemeal deliveries of their feed grains, less waiting for their mixed feed, and possible efficiencies in farm operation and feeding. Feed mixers like the operation because of the service charges received, the reduction of customer shifts from plant to plant, better scheduling of the production operation, and possibly more efficient use of their labor. Generally the volume of grains in the grain bank was restricted to 3 months' or at most a year's supply of the grain in the custom feed formula.

4/ This question is being investigated more completely by Purdue University under contract with the Department.

Table 9.--Percentage of mixers providing a grain bank for farmers,
by annual tonnage mixed, 8 States, 1959

Annual tonnage mixed	Mass.	Pa.	Ga.	Ind.	Iowa	Colo.	Calif.	Wash.
	Percent	Percent	Percent	Percent	Percent	Percent	Percent	Percent
Less than 10,000.....	0	30	22	68	46	32	14	37
10,000-24,999.....	0	67	24	84	41	43	7	50
25,000-49,999.....	0	33	17	100	0	75	12	0
50,000 and over.....	0	<u>1/</u>	17	50	17	<u>1/</u>	9	0

1/ Single plant responses not shown in the larger volumes to avoid disclosure of plant identity.

Sales Practices

Bulk sales of feed increased rapidly in many parts of the country, but in some areas feed in bags still is the major portion of total sales (table 10). The most rapid adoption of the bulk method of distribution and feeding has occurred in the West, represented in this study by California and Colorado. The East, represented by Massachusetts and Pennsylvania, has for the most part tended to retail feed in bags, although the large plants in Massachusetts showed signs of moving into bulk distribution.

In general, local competition seemed to force both large and small plants into bulk distribution once the trend has begun in the area. There was only a slight tendency for the smaller mixers to retain a somewhat larger proportion of their volume as sales in bags once the area shifts to bulk distribution and feeding.

Bulk distribution appeared to be tied in with the trend towards larger farms and demand orientation of the feed mixing industry as well as with integration. Demand orientation is a trend encouraging formula feed mills to locate closer to the consumption areas. This trend has grown from the increased demand for services and the growth of service competition.

With bulk distribution mixed feed can be distributed from the mill by bulk truck. Bulk delivery of feed has increased rapidly in recent years. This system of feed handling is favorable to the mechanized feeder operations of the larger farm production units because of the savings in labor and in feed costs.

Some areas are behind others in the trend towards the full use of bulk deliveries of feed; many establishments in these areas have converted to bulk for some feeders. A feed retailer or mixer cannot change to bulk faster than the feeders are willing to accept the change. Certainly agreements have to be made between the feeder and the feed supplier before any major change is possible.

Table 10.--Percentage of mixed feed bagged, by annual
tonnage mixed, 8 States, 1959

Annual tonnage mixed	Mass.	Pa.	Ga.	Ind.	Iowa	Colo.	Calif.	Wash.
	Percent	Percent	Percent	Percent	Percent	Percent	Percent	Percent
Less than 10,000.....	91	81	77	58	41	36	41	66
10,000-24,000.....	100	77	65	59	16	40	20	36
25,000-49,000.....	99	65	63	78	26	12	8	67
50,000 and over.....	67	1/	43	75	54	1/	14	30

1/ Single plant responses not shown in larger volumes to avoid disclosure of plant identity.

Complete feeds represented larger percentages of sales in Massachusetts and California than in any of the other States in the survey (table 11). About 90 percent of the feed sold in Massachusetts and 80 percent in California was a complete feed. In contrast, only about 42 percent was a complete feed in Colorado; the remainder, or 58 percent, was a feeding concentrate or supplement containing all ingredients except the grains. In the remaining 5 States, complete feeds represented between 55 and 65 percent of the total feeds sold. The percentage of complete feeds produced by large and small firms does not indicate any definite trend.

The high percentages of complete feed for Massachusetts and California may be explained by two factors. First, both States ship in large quantities of grain. The livestock agriculture in both States is largely poultry, which uses predominately a complete feed. Therefore, it is more likely for the feed manufacturers to receive the grains shipped from surplus areas and produce the complete feeds to be used by the feeders. A second factor is labor costs. On large production units, using a complete feed with a highly automated feeding system reduces labor to a minimum.

Many factors can influence the sale of complete and concentrate feeds: The type of animal and livestock production, surplus or deficit production of feed grains, integration of production, and the prevalence of on-the-farm mixing.

Feed mixers in Indiana retailed about 80 percent at the mixing plant (table 12). In Massachusetts, the small plants retailed about this same proportion at the mixing plant but the large plants sold little or no feed at the mixing plant. Feed mixers in all of the other States sold at the plant an average of from 40 to 75 percent of the feed mixed. The midwestern and Colorado plants were on the higher end of this range and Washington and California plants were the lower end.

As feed mixers' tonnage increased, the percentage retailed from the plant tended to decrease, since large manufacturers tend to have larger sales areas. Often an expansion program forces the manufacturer to establish company-owned stores or to distribute feed through other retailers.

The remaining feed sales were made either directly to farmers through field salesman or through other retail dealers. Sales directly to farmer feeders were important in two States -- California and Georgia (table 13). There were also indications that direct sales may be moving into the States of Washington and Massachusetts. It appeared that when direct sales become an important channel in an area, the importance of this type of sale increased with the size of the plant volume.

A high degree of specialization in livestock encourages direct selling to feeders. Livestock specialization and bulk handling of feeds are complementary practices. Bulk feed is delivered directly from the manufacturer to the farm and is placed in the automated feeding system; it is not handled by the feeder at all. This is only one reason for selling feeds directly.

Larger feeders are persuasive in getting feed manufacturers to sell directly. Many times these feed manufacturers are not growing with the feed industry around them. Some manufacturers have abandoned a dealer organization and sell all tonnage directly to the feeder.

Apparently the sale of feed through retailers under contract with the manufacturing company was not an important channel of sale in any of the States included in the study. The small amount of feed sold through this channel seemed to be concentrated primarily in the three western States although some was reported in all States.

Table 11.--Percentage of mixed feed sold as a complete feed,
by annual tonnage mixed, 8 States, 1959

Annual tonnage mixed	Mass.	Pa.	Ga.	Ind.	Iowa	Colo.	Calif.	Wash.
	Percent	Percent	Percent	Percent	Percent	Percent	Percent	Percent
Less than 10,000.....	91	60	68	66	56	57	83	82
10,000-24,999.....	100	35	60	52	73	24	84	37
25,000-49,999.....	98	100	63	75	63	87	70	40
50,000 and over.....	94	<u>1</u> /	65	53	64	<u>1</u> /	91	67

1/ Single plant responses not shown in larger volumes to avoid disclosure of plant identity.

Table 12.--Percentage of feed sales retailed at the mixing plant,
by annual tonnage mixed, 8 States, 1959

Annual tonnage mixed	Mass.	Pa.	Ga.	Ind.	Iowa	Colo.	Calif.	Wash.
	Percent	Percent	Percent	Percent	Percent	Percent	Percent	Percent
Less than 10,000.....	84	85	64	83	80	51	45	80
10,000-24,999.....	100	62	42	83	90	57	23	45
25,000-49,999.....	1	82	18	100	75	90	73	50
50,000 and over.....	2	<u>1</u> /	17	47	50	<u>1</u> /	32	0

1/ Single plant responses not shown in larger volumes to avoid disclosure of plant identity.

Most of the feed sold at retail, at other than the mixing plant location, was sold through retail outlets owned by the company or by retailers with informal agreements. Retailers with informal agreements seemed to be somewhat more important in Georgia, Indiana, and Iowa. In the other States there seemed to be about a 50-50 split between the company-owned and informal-agreement retailers.

In each State, most of the feed was sold in the immediate vicinity of the manufacturing plant. However, the large plants in Pennsylvania and Massachusetts, probably due to milling-in-transit advantages, sold a large share of their mixed feeds more than 100 miles from the plant (table 14). There did not seem to be any definite pattern of shipments for the survey firms.

Feed mills are becoming demand oriented. Plants locate near the feeders to meet competition and to offer better service on feeding problems. The upward trend in bulk delivery offered to farmers is closely associated with the establishment of new plants. Likewise, some feed manufacturers whose plants are far from the established sales area use integration to stimulate livestock production in the area around their plant.

Table 13.--Percentage of feed mixed that was sold directly to farmers, by annual tonnage mixed, 8 States, 1959

Annual tonnage mixed	Mass.	Pa.	Ga.	Ind.	Iowa	Colo.	Calif.	Wash.
	Percent	Percent	Percent	Percent	Percent	Percent	Percent	Percent
Less than 10,000.....	13	11	17	14	16	42	27	8
10,000-24,999.....	0	10	20	0	1	10	55	33
25,000-49,999.....	34	0	44	0	0	0	26	35
50,000 and over.....	10	<u>1</u>	67	3	0	<u>1</u>	60	5

1/ Single plant responses not shown in the larger volumes to avoid disclosure of plant identity.

Table 14.--Percentage of feed mixed that was sold more than 100 miles from plant, by annual tonnage mixed, 8 States, 1959

Annual tonnage mixed	Mass.	Pa.	Ga.	Ind.	Iowa	Colo.	Calif.	Wash.
	Percent	Percent	Percent	Percent	Percent	Percent	Percent	Percent
Less than 10,000.....	0	3	7	5	9	9	4	12
10,000-24,999.....	0	8	23	3	1	26	8	0
25,000-49,999.....	60	6	24	0	4	7	1	28
50,000 and over.....	40	<u>1</u>	11	17	20	<u>1</u>	30	9

1/ Single plant responses not shown in larger volumes to avoid disclosure of plant identity.

RECENT TRENDS

The structure and practices of the feed mixing industry have been greatly affected by trends inside and outside the industry itself. The analysis of these

trends and their impact on the industry requires a very detailed analysis as contrasted to the survey technique used in this study. 5/

The results of industry opinions on recent trends in on-farm mixing, custom mixing, mixing supplements, direct sales, bulk distribution, and retail sales areas are summarized to help round out the picture of the current structure and practices in the feed mixing industry.

On-Farm Mixing

There always has been some on-farm mixing, but in recent years the practice seems to have increased, especially on the larger farms. For this reason each respondent was asked to estimate the percentage of the larger farmers in his trade area who have installed feed mixers and grinding equipment for on-the-farm mixing during the last 5 years. Large farmers were not defined and memory often overstates past happenings, but the replies show the direction of the trend and the relative impact in different areas of the country.

Respondents in Colorado indicated that about 18 percent of the larger farmers in their trade area had installed on-farm mixing equipment (table 15). The industry

5/ A study of the impact of integration on the feed milling industry is being conducted by Iowa State College under contract with the Department, and the Department plans to study the impact of larger size farms as soon as data on on-farm mixing costs become available from a Department farm production study.

Table 15.--Percentage of large feeders who installed on-farm mixing equipment between 1955 and 1959 as reported by the grain industry, 8 States

State	Average	Retail only	Retail and mix	Mix only	Related industry 1/
	Percent	Percent	Percent	Percent	Percent
Massachusetts.....	11	20	4	1	5
Pennsylvania.....	6	9	5	7	10
Georgia.....	7	11	6	9	6
Indiana.....	4	6	4	2	7
Iowa.....	6	6	6	9	7
Colorado.....	18	12	14	49	22
California.....	11	9	8	18	15
Washington.....	14	23	7	13	15

1/ Primarily country elevator operations.

in Washington, California, and Massachusetts indicated that between 11 and 14 percent of their larger farmers had made similar installations.

Replies from the remaining States -- Georgia, Pennsylvania, Iowa, and Indiana -- indicated that only 4 to 7 percent of their large farmers installed on-farm mixing equipment during the last 5 years. This was somewhat surprising, since on-farm mixing can be expected to have some relationship to the availability of the farmer's supply of homegrown grains. Apparently, however, stationary or mobile custom mixing and grain bank operations have counteracted this trend in the grain-surplus areas, while in grain-deficit areas present on-farm mixing is tied in very closely with large feeding operations and the type of operations usually involved in feeder contracts and integrations.

Feed Supplements and Complete Feeds

The feed industry in Pennsylvania, Georgia, Indiana, Iowa, and Colorado indicated a definite shift from complete feeds toward concentrates or supplements during the past 5 years (table 16). In Massachusetts and California, the industry indicated that they sold about the same proportion of their total volume as feeding and mixing supplements in 1959 as in 1955.

Table 16.--Percentage of establishments estimating changes in the volume of supplements handled in relation to the volume of complete feeds between 1955 and 1959, 8 States ^{1/}

Item	Increased		Decreased		Remained the same
	Slowly	Rapidly	Slowly	Rapidly	
	Percent	Percent	Percent	Percent	Percent
State:					
Massachusetts.....	6	3	17	4	70
Pennsylvania.....	45	15	8	1	31
Georgia.....	43	18	6	1	32
Indiana.....	38	13	7	2	40
Iowa.....	37	13	14	8	28
Colorado.....	33	9	13	3	42
California.....	22	8	17	12	41
Washington.....	30	6	20	4	40
Average.....	34	12	12	5	37
Type of establishment:					
Retail only.....	27	6	15	7	45
Retail and mix.....	38	12	12	4	34
Mix only.....	35	23	8	4	30
Related industry.....	37	9	12	6	36
Average.....	34	12	12	5	37

^{1/} About 5 percent "no replies" have been excluded from this analysis.

Possibly just as significant as the geographic difference in the impact of this trend, is the fact that respondents noting it increased as the degree and volume of mixing increased (table 16). Apparently, many retailers who do not mix did not handle as large a share of the supplement market and therefore did not feel the impact of the trend toward supplements.

Custom-Mixed and Formula Feeds

The volume of custom-mixed feed appears to have grown relative to formula feed volume from 1955 to 1959 in Pennsylvania, Georgia, Indiana, Iowa, and Colorado, according to estimates of industry members (table 17). It appeared to represent about the same proportion of the total feed mixed as it did 5 years earlier in California and Washington, and to be somewhat less important in Massachusetts.

Again, those who mix feed noted and reported these trends more frequently than did the "retailers only" or "related grain industry" respondents (table 17).

Table 17.--Percentage of establishments estimating changes in the volume of custom-mixed feeds in relation to volume of formula feeds between 1955 and 1959, 8 States ^{1/}

Item	Increased		Decreased		Remained the same
	Slowly	Rapidly	Slowly	Rapidly	
	Percent	Percent	Percent	Percent	Percent
State:					
Massachusetts.....	10	4	33	14	39
Pennsylvania.....	39	15	19	3	24
Georgia.....	40	16	16	3	25
Indiana.....	41	10	13	5	31
Iowa.....	42	21	9	3	25
Colorado.....	37	10	14	3	36
California.....	22	10	24	15	29
Washington.....	22	10	21	7	40
Average.....	34	14	16	6	30
Type of establishment:					
Retail only.....	26	9	20	9	36
Retail and mix.....	39	15	13	4	29
Mix only.....	38	23	13	2	24
Related industry.....	28	10	19	9	34
Average.....	41	13	14	5	27

^{1/} About 3 percent "no replies" have been excluded from this table.

Growth of Direct Feed Sales

Remarkable uniformity in the view that direct sales of feed increased, but at a slow pace, during the 5 years is shown by the industry estimates (table 18). A more rapid pace was reported in the Western States of California and Washington.

Those reporting an increase represented between 51 percent (Massachusetts) and 75 percent (California) of the respondents to the inquiry. By type of establishments the percentage of respondents reporting an increase varied from 58 percent (related industry) to 69 percent (mix only).

Bulk Sales

An average of 78 percent of the respondents indicated a trend towards bulk sales and distribution in their trade area (table 19). The trend towards bulk sales and delivery appeared to be especially rapid during this period in California, Georgia, and Washington where between 44 and 48 percent reported rapid increases. These increases in bulk sales were especially uniform in the States of Massachusetts, Indiana, and Iowa where more than 80 percent of the respondents reported increases but at a somewhat slower rate.

Table 18.--Percentage of establishments estimating changes in volume of feed sold direct to farmers, between 1955 and 1959, 8 States ^{1/}

Item	Increased		Decreased		Remained the same
	Slowly	Rapidly	Slowly	Rapidly	
	Percent	Percent	Percent	Percent	Percent
State:					
Massachusetts.....	35	16	7	3	39
Pennsylvania.....	38	15	8	1	38
Georgia.....	42	21	8	1	28
Indiana.....	44	18	6	1	31
Iowa.....	44	11	12	1	32
Colorado.....	43	19	5	1	32
California.....	38	37	6	1	18
Washington.....	36	32	5	0	27
Average.....	41	19	8	1	31
Type of establishment:					
Retail only.....	38	21	8	2	31
Retail and mix.....	41	19	8	1	31
Mix only.....	48	21	4	2	25
Related industry.....	38	20	8	1	33
Average.....	41	19	8	1	31

^{1/} About 7 percent "no replies" were excluded from this table.

Table 19.--Percentage of establishments estimating changes in volume of bulk feed sales in relation to volume of bagged feed sales between 1955 and 1959, 8 States 1/

Item	Increased		Decreased		Remained the same
	Slowly	Rapidly	Slowly	Rapidly	
	Percent	Percent	Percent	Percent	Percent
State:					
Massachusetts.....	57	29	2	0	12
Pennsylvania.....	56	18	<u>2/</u>	<u>2/</u>	26
Georgia.....	25	44	1	1	29
Indiana.....	51	32	1	0	16
Iowa.....	45	37	1	0	17
Colorado.....	43	29	2	2	23
California.....	31	48	1	7	13
Washington.....	32	44	1	0	22
Average.....	44	34	1	1	20
Type of establishment:					
Retail only.....	45	29	3	2	21
Retail and mix.....	46	40	<u>2/</u>	<u>2/</u>	14
Mix only.....	39	44	1	1	15
Related industry.....	43	29	3	1	24
Average.....	44	35	2	1	18

1/ Less than 5 percent "no replies" were excluded from this table.

2/ Less than 1 percent.

There was considerable uniformity in the replies based on the type of establishments reporting, but again those who mix feed tended to note the trend more frequently than those who do not (table 19).

Sixty-one percent of the respondents indicated that they believed that bulk feed sales had a tendency to decrease feed prices. The largest percentages were again reported in California, Washington, and Georgia where the bulk sales trend was reported to be most rapid. Even the types of establishments least closely involved in bulk sales reported that bulk sales decreased average feed prices (45 percent of the related grain industry and 57 percent of the retailers.)

Likewise, 63 percent of the respondents indicated that bulk sales tended to increase the feed services performed for the farmer; the largest percentages were reported in Iowa, Indiana, Colorado, and Pennsylvania. Apparently, this area of the country was increasing feed services to a greater degree than other areas to help sell bulk operations. Again, those types of industry not closely related to bulk distribution substantiate the contention that services were increased.

As bulk distribution increases it can have both favorable and unfavorable effects on the different types of establishments operating in the industry. For this reason,

the survey also included questions on apparent impacts on retailers, local mixers, and nonlocal mixers. On the basis of the replies, it seemed that as bulk distribution increased it benefited the local mixers to the greatest degree. Replies split about 50-50 on the impact on retailers and nonlocal mixers. Reports from the related industry category (those not directly involved) again agreed with the average industry replies even though numerically it was a relatively small group.

Reports from all States except Massachusetts indicated that the trend towards sales in bulk helped both the stationary and mobile custom-feed millers. This was especially true of the reports from the midwestern areas.

Geographic Sales Areas

All retail respondents were asked to indicate whether or not the geographic size of their sales areas had changed during the last 5 years. Generally close to or over 50 percent of them indicated no change (table 20). However, of those indicating that their sales area had increased, those who both retailed and mixed feed reported it more frequently than those who only retailed. The reverse was true for those who reported decreases in the size of their sales area.

Table 20.--Percentage of feed establishments reporting that their sales area changed between 1955 and 1959, 8 States 1/

State, and type of operation	Increased	Decreased	Same
	Percent	Percent	Percent
Massachusetts:			
Retail only.....	28	39	33
Retail and mix.....	20	27	53
Pennsylvania:			
Retail only.....	8	38	54
Retail and mix.....	19	24	57
Georgia:			
Retail only.....	27	41	32
Retail and mix.....	35	8	57
Indiana:			
Retail only.....	32	15	53
Retail and mix.....	35	15	50
Iowa:			
Retail only.....	30	17	53
Retail and mix.....	42	7	51
Colorado:			
Retail only.....	16	22	62
Retail and mix.....	42	12	46
California:			
Retail only.....	20	36	44
Retail and mix.....	32	20	48
Washington:			
Retail only.....	10	34	56
Retail and mix.....	26	16	58

1/ Less than 2 percent "no replies" were excluded from the table.

APPENDIX.--METHODOLOGY

The mail survey was conducted in 8 States in various areas of the country -- Massachusetts, Pennsylvania, Georgia, Indiana, Iowa, Colorado, California, and Washington. These 8 States were selected with the help of members of the industry to represent different types of livestock and poultry production and different types of organization and practices in the feed mixing industry.

The mailing lists were constructed from lists provided by State Governments, trade publications, and industry associations. Although the final list was the best one which could be assembled, it still left much to be desired.

The questionnaire was mailed early in 1960 to all establishments on the lists in Massachusetts, Georgia, Colorado, and Washington. It was mailed to every other establishment on the combined list of mixers and retailers in Pennsylvania and on the list of feed mixers in Indiana, Iowa, and California. The retailers' lists for Indiana, Iowa, and California were sampled by taking every third establishment.

A total of 4,788 questionnaires were sent out in the first mailing. Two weeks later a second mailing was made to all nonrespondents. The problem of knowing the number of establishments either mixing or retailing feed is highlighted by the fact that 31 percent of the questionnaires returned had a notation that the addressees were no longer in the feed mixing or retailing business. It seems reasonable to assume that this percentage was even higher among the nonrespondents.

The actual returned response however, was nearly 60 percent, or 2,794 schedules. This resulted in a total of about 2,000 usable schedules after the out-of-business responses and the few incomplete questionnaires were excluded. The number of responses used in the various sections of the report will vary from 178 establishments that mix only to 852 for establishments that both retail and mix. 6/

Attempts were made to establish the validity of the sample by expanding it to completion for both nonresponse and sampling procedure. However, the lack of valid plant numbers and production volume for the entire industry in each State made this impossible. Because of the definition used by the Bureau of Census, the reported number of plants and volume of livestock feeds handled are much below the actual industry activity. For example, the 1958 Census of Manufacturers indicated a U. S. total of 2,379 feed manufacturers. Industry lists such as were used, yield numbers between 7,000 and 8,100. Estimates by the American Feed Manufacturers Association, feed trade publications, and USDA indicated that feed mixing production and consumption in the entire United States equaled between 39 and 40 million tons in 1959. By comparison, the survey volume of feed mixed (including custom mixed) in the 8 States was 16,777,000 tons in 1959 or about 130 percent of the 1958-59 formula feed consumption estimated by trade publications. 7/ For example, with a 52-percent response rate in Colorado the plants mixing feed reported mixing about 600,000 tons in 1959 while the trade publication estimates indicated a formula feed consumption of 193,000 tons in 1958-59. 8/

6/ Data were machine tabulated. Questionnaires were used even if one or two questions were not answered; all responses to each question or group of questions are included. For example, some establishments reported their function (retail only, retail and mix, or mix only) and answered other questions except the volume of their operation.

7/ Miller Publishing Company. Feedstuffs. January 28, 1961, p. 88.

8/ Retail estimates based upon this survey also exceed these consumption estimates by about the same amount.

In addition to the problem of estimating the total number of plants and the volume for the industry this comparison also points up another major problem. A study designed to analyze the functions of (1) retailing feed and (2) mixing feeds (including both formula and custom-mixed feeds) is bound to result in double counting of volumes. This is due to the fact that premixes and mixing supplements or concentrates mixed in one establishment may represent 1 to 45 percent of the mix which is later combined with other ingredients at another establishment. It is almost impossible to separate and exclude this double counting.

In view of these problems and the great expense involved in a relatively complete check of nonrespondents in each of the 8 States, no personal interview of nonresponse was included in the study. Instead, this report should be interpreted as summarizing the operations and estimates of the respondents who produced 16,777,000 tons of feed in 1959 or about 40 percent of the total volume of formula feed reported consumed in the United States. In view of (1) the large volumes mixed and retailed by the total respondents, (2) the fact that these respondents show there is still a preponderance of small retailers and mixers in the industry, and (3) the fact that the report summarizes the responses by types of operation performed and by volume groupings within these types, it is believed that these findings are representative of the industry located in each of the 8 States.



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